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## **Marine Bioacoustics: Soundtracks the Future**

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### **LONG-TERM GOALS**

The primary goal of our project is to provide advanced undergraduates, graduate students, and postdoctoral investigators with a broad understanding of ocean acoustics as well as the techniques used to study the ecology of marine animals *in situ*. By bringing together many of the top researchers in marine bioacoustics, biological oceanography, and marine biology, we provide students with a unique opportunity to work side by side with world experts using state-of-the-art tools and technologies. A secondary goal of the project is to provide a setting for developing and testing new technologies. In this manner, it serves as a research magnet, attracting leading scientists to conduct their own research in a creative teaching and learning environment that catalyzes interactions across the various disciplines associated with Bioacoustical Oceanography.

### **OBJECTIVE**

To provide students with a broad understanding of the acoustic techniques used to study the distribution and behavior of marine animals in the context of their physical/chemical/biological environment.

### **APPROACH**

Through lectures, demonstrations, and field exercises, we provide students with a unique opportunity to learn and work side by side with top scientists using state-of-the-art bioacoustic tools and techniques. During winter courses, we provide students with hands-on opportunities to investigate passive acoustic methods for studying humpback whale ecology. During summer courses, we provide students 1.) with a strong conceptual understanding of marine bioacoustics theory through lectures and laboratory exercises, and 2.) practical hands-on experience through field experiments and cruises.

### **WORK COMPLETED**

During the winter course, field studies were conducted along the Kohala Coast of Hawaii Island to demonstrate methods to the students. In the laboratory, students were taught how to localize and track vocalizing humpback whales with data collected the previous year using Wave Gliders. Students were also taught how to analyze and classify sounds using the Raven software package.

## **RESULTS**

Papers based on research conducted during previous courses were presented at the 20<sup>th</sup> Biennial Conference on the Biology of Marine Mammals in New Zealand and at the Ocean Sciences Meeting in Honolulu, HI. One manuscript has been submitted from our previous research, and two additional manuscripts are currently in preparation.

## **IMPACT**

Students from around the world come to these courses because they provide the best training available in Marine Bioacoustics. The student participants from this year bring our total number of students since 1993 up to 313 students from 32 different countries. Alumni from our courses have become national and international leaders in the fields of Marine Bioacoustics and Bioacoustical Oceanography, and we are now training the second generation of students in this field (training the students of our former students).

## **RELATED PROJECTS**

None.